

The background of the slide features a large, faded, circular seal. The seal's outer ring contains the text "STATE WATER RESOURCES CONTROL BOARD" at the top and "CALIFORNIA" at the bottom. Inside the ring, the word "EUREKA" is visible at the top, and there is a central emblem depicting a landscape with a mountain and water.

Total Maximum Daily Loads for PCBs in San Francisco Bay

Fred Hetzel
SFB-RWQCB
fh@rb2.swrcb.ca.gov
510-622-2357



Preliminary Project Report

- ☐ Provides stakeholders the opportunity to comment on the technical aspects of the PCBs TMDL
- ☐ Combines the information gathered to date that will be used to develop the implementation and monitoring plans



Industrial Uses of PCB Mixtures

- ❑ Closed applications
 - Capacitors and transformers
 - Heat transfer and hydraulic fluids
- ❑ Open applications
 - Plasticizers
 - Surface coatings and paints
 - Flame retardants
 - Inks and adhesives
 - Pesticide extenders
 - Carbonless duplicating paper



PCBs TMDL Issues

- ❑ “Legacy pollutants”/“Unregulated” sources
- ❑ Lack of current numeric standards for sediments or urban runoff
- ❑ Municipal effluent represent a relatively small mass but the concentrations are greater than CTR criterion
- ❑ Major historical PCB users
 - General Electric
 - Westinghouse
 - Pacific Gas and Electricity
 - Department of Defense

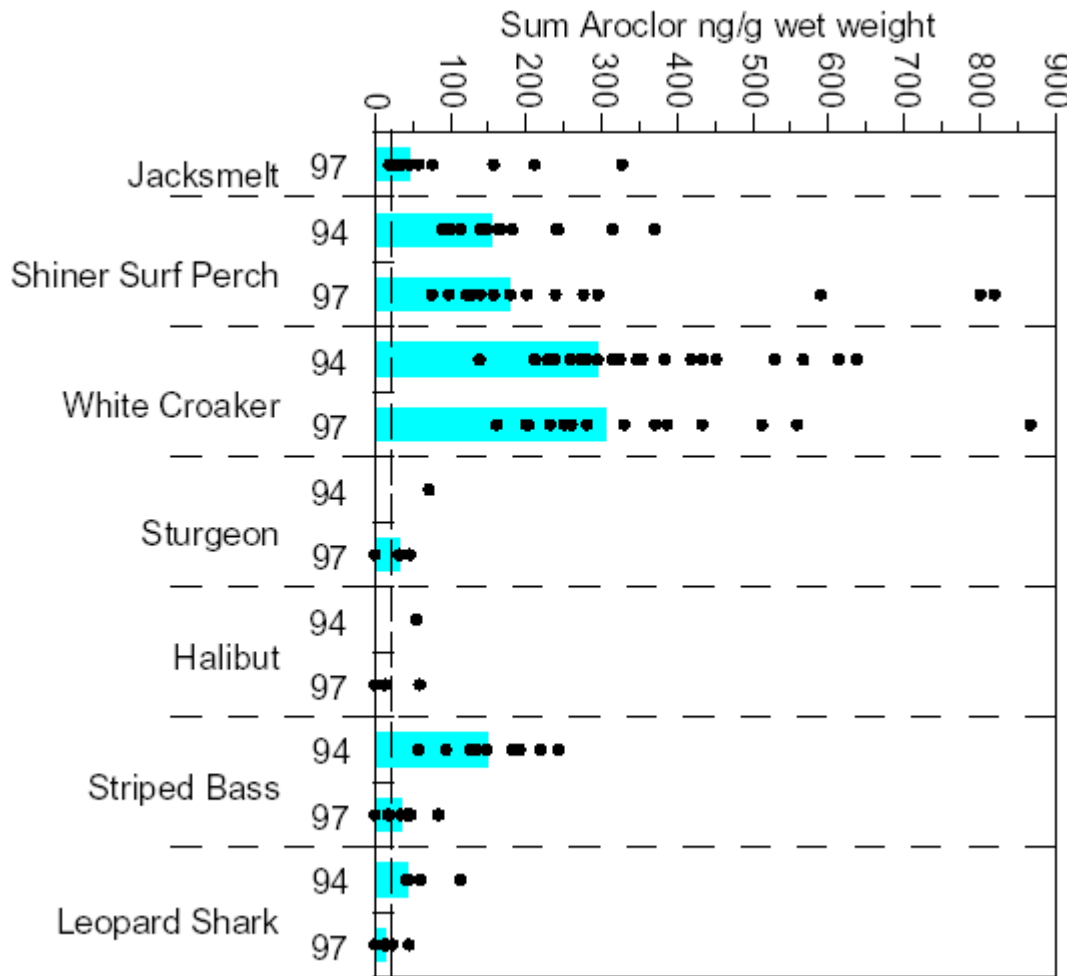


Problem Statement

- ☐ PCBs on 303(d) list due to interim health advisory for fish consumption
- ☐ U.S. EPA California Toxics Rule
Human health risk assessment = total PCBs criteria in the water column of 0.00017 $\mu\text{g/L}$ (parts per billion)



PCBs Concentrations in Fish Tissue from San Francisco Bay (SFEI, 1999)



FDA Action Level = 2,000 ng/g (parts per billion)



PCBs in Water
1993-1998

40% 50 60 70 80 90 100

Percentage of samples
exceeding human health
guidelines

n=6 to 16

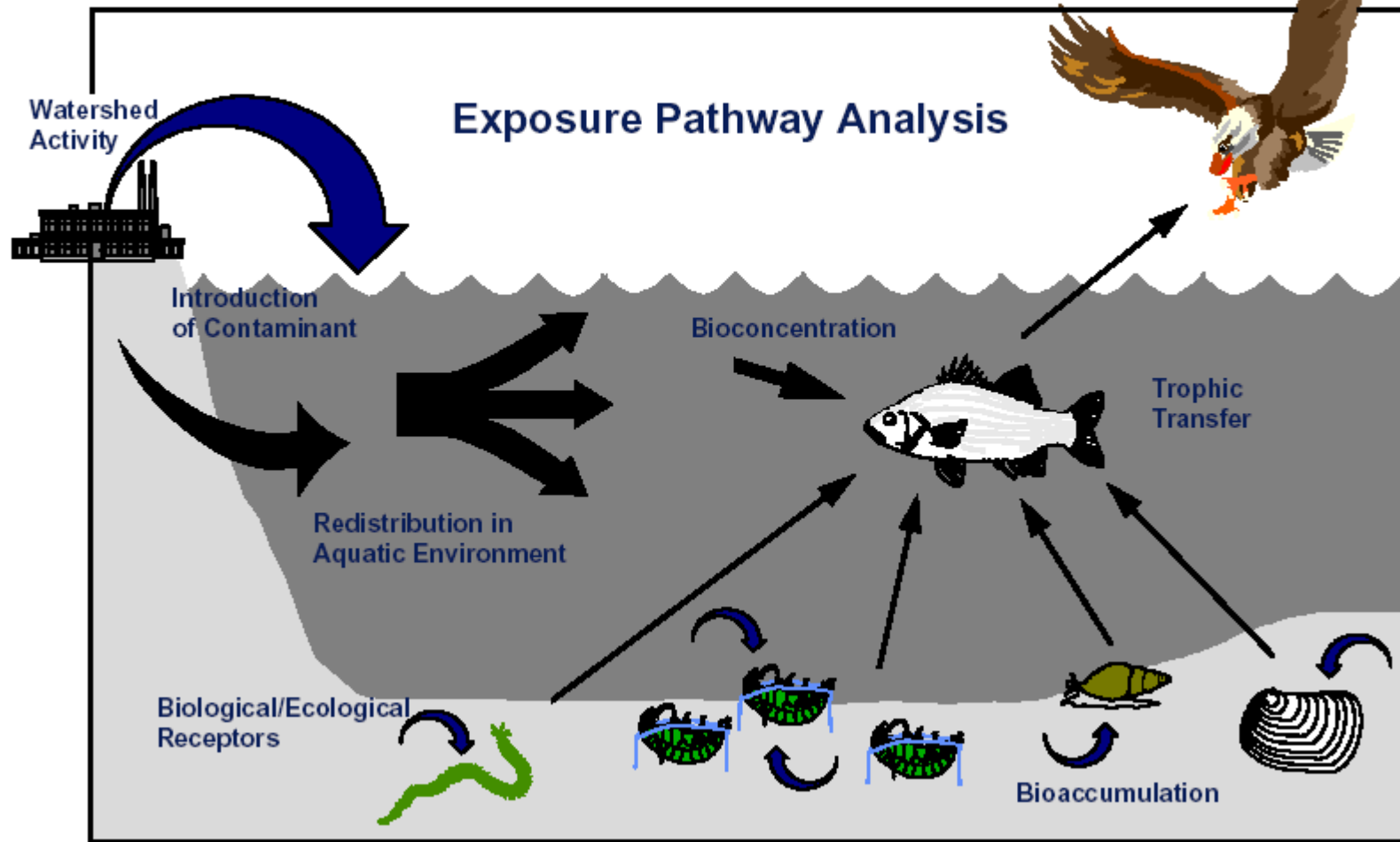


Problem Statement-Issue

- ☐ Numeric criteria for PCBs in sediment have not been developed.
- ☐ Basin Plan Narrative Objective:
...Controllable water quality factors shall not cause a detrimental increase in concentrations of toxic substances found in bottom sediments or aquatic life...



Conceptual Model



(USEPA)



Proposed Numeric Targets for PCBs

- ❑ Water column = 170 parts per quadrillion
From U.S. EPA California Toxics Rule
- ❑ Sediment = 2.5 parts per billion
Based on generic bioaccumulation factors
Not specific to San Francisco Bay
- ❑ Fish tissue = 23 parts per billion
Based on human health risk assessment

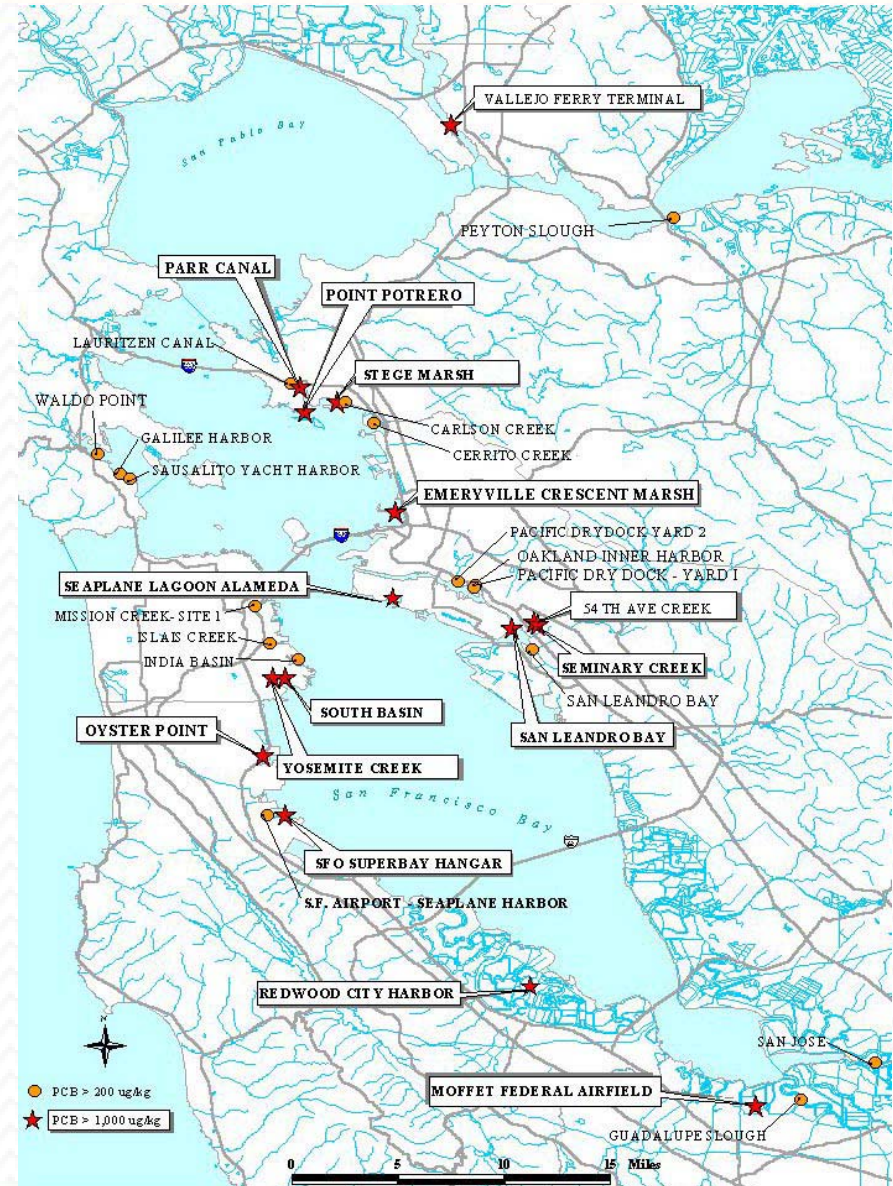


Sediment PCBs Concentrations

- ❑ Target = 2.5 parts per billion
- ❑ Current Ambient = 20-35 parts per billion
- ❑ Near-shore ambient = higher ?



Locations with Elevated PCBs Concentrations in San Francisco Bay Sediments





Sources and Loads Assessment

- ☐ Atmospheric deposition
- ☐ Sediment “hot spots” in water
- ☐ Dredging
- ☐ Treated effluent
- ☐ Delta inflow/Golden Gate outflow
- ☐ Urban runoff & “hot spots” on land



PCBs Load Estimates

Sources/Pathways	Load Estimate (Kg/Year)
Atmospheric Inputs	(-7)
In-Bay PCB "Hot Spots"	?
Bay Sediments-Dredge Material Disposal	30
Treated Effluent	3
Delta Inflow (from PCB water concentrations)	35
Golden Gate Outflow (from PCB water concentrations)	?
Urban Runoff	40



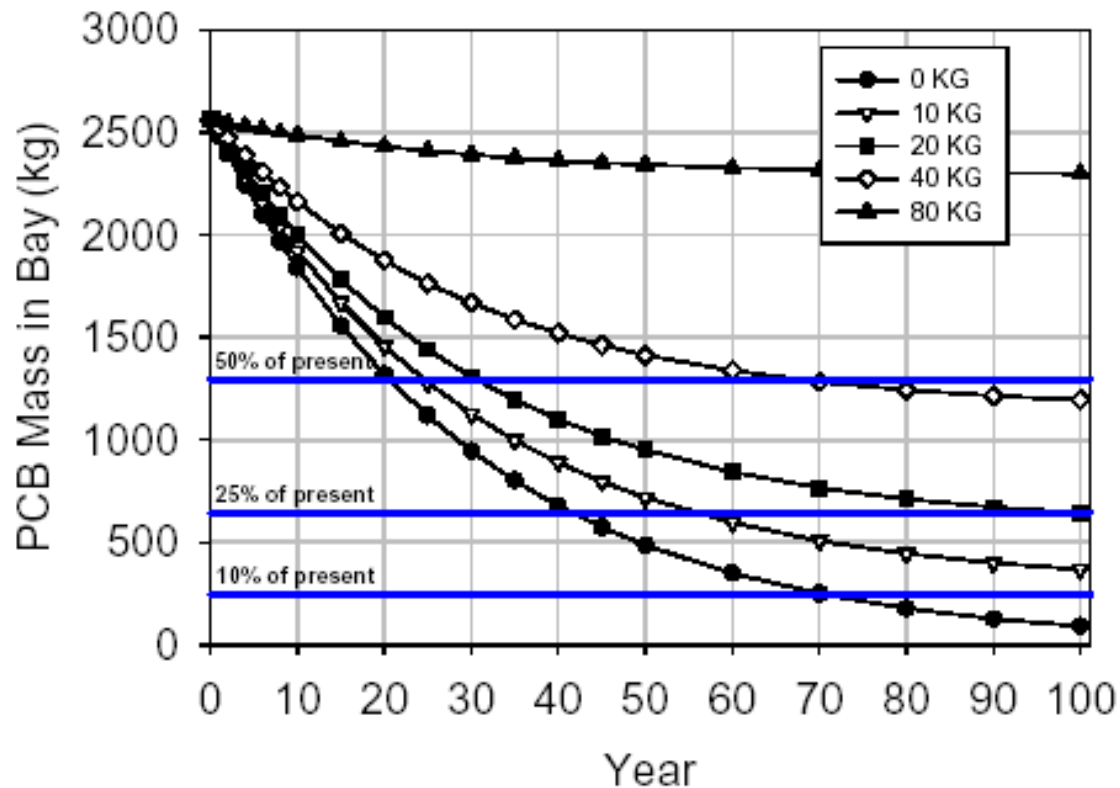
Estimates of In-Bay PCBs Mass

Compartment		PCB Mass (kg)
Water		3-5
Sediments	Total	5,000-50,000
	Active Layer	300-2,000



Proposed Allocations

- ❑ **Treated Effluent** = Current mass with a factor for population growth
- ❑ **Run-off** = Need to meet sediment targets
Source investigations
- ❑ **Hot Spots** = Need to meet sediment targets
Source investigations
- ❑ **Dredging** = Need to meet ambient sediment targets
- ❑ **Background and atmospheric deposition** = 0



Predicted PCB Reductions as a Function of Loads

(SFEI, 2002)



PCB TMDL-Next Steps

- ❑ Implementation Plan - *Summer 2003*
 - Pollution prevention and control actions
 - NPDES permit limits
 - “Hot spot” clean-up
- ❑ Monitoring - *Summer 2003*
 - Adaptive implementation
 - Long-Term Monitoring
- ❑ Basin Plan - *Summer 2004*